

### EXAMINER AMENDMENT

1. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it **MUST** be submitted no later than the payment of the issue fee. Authorization for this examiner's amendment was given in a telephone interview with Barry Shuman on 4/13/2010.

The application has been amended as follows:

Claim 12 is **cancelled**.

1. The following is an examiner's statement of reasons for allowance:

**Claims 1-3, 5-7 and 9-11 are allowable for the following reasons:**

Regarding claim 1, Tawada (JP 2003-243676) discloses a substrate for thin film solar cells with a transparent insulating substrate and a transparent electrode layer including zinc oxide wherein the transparent insulating substrate consists of a smooth surface base material and a foundation layer with transparent micro-particles (see Figure and abstract). However, this reference is silent as to the transparent insulating substrate having a fine surface unevenness having a root-mean-square deviation of the surface of 5 to 50 nm and is also silent as to the micro-particles having an average particle diameter of not less than 10nm and not more than 95nm (Tawada specifically teaches his particles to be 0.1 to 1 microns (abstract)).

Matsui et al. (*Influence of substrate texture on microstructure and photovoltaic performances of thin film polycrystalline silicon solar cells*) teaches using a textured

Art Unit: 1795

SnO<sub>3</sub> layer having a root mean square (RMS) roughness of 38 nm (abstract). However, this reference fails to teach any structural limitations of the thin film solar cell of the instant claim and also fails to teach a *transparent insulating substrate* having a RMS deviation of 5 to 50nm.

Robinson et al. (US 2005/0238871) teaches the use of colloidal silica particles of 5-25 nm in a polymeric film substrate to *improve surface smoothness*. However, this reference fails to teach the structural components of the instant claim and is directed to forming a substrate surface with improved *smoothness*.

Tawada, Matsui and Robinson (alone or in combination) fail to disclose or render obvious a thin film solar cell with a transparent insulating substrate consisting of transparent micro-particles having an average diameter 10-95 nm wherein the substrate has a RMS deviation of 5 to 50 nm. Further, there are no teachings in the prior art that would motivate one of ordinary skill in the art to make such a thin film solar cell.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

### ***Contact/Correspondence Information***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Shannon Gardner whose telephone number is (571)270-5270. The examiner can normally be reached on Monday to Thursday, 5am-3pm EST.

Art Unit: 1795

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Alexa Neckel can be reached on 571.272.1446. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/S. G./  
Examiner, Art Unit 1795

/Alexa D. Neckel/  
Supervisory Patent Examiner, Art Unit 1795